we do not see in what respect the representation of waves by their wave-fronts is associated with less fiction than what the authors refer to as "the time-honoured fiction of rays." Whether the wave is represented by its front or its normal is a question merely of convenience or lucidity. The fiction which affects both equally consists in regarding the wave as a simple spherical one, and when the question is the higher one of the deviation from sphericity, we think the advantage lies all on the side of the method of rays. We conclude by wishing this volume all success; it deserves to be widely read.

THE PRINCE OF ENTOMOLOGY.

Les Débuts d'un Savant Naturaliste. Le Prince de l'Entomologie. Pierre-André Latreille à Brive de 1762 *à* 1798. By Louis de Nussac. Pp. vii+264. (Paris: G. Steinheil, 1907.) Price 5 francs.

THE subject of this memoir was the natural son of Baron d'Espagnac, and some doubt exists as to the exact date and place of his birth; his biographers, however, are agreed in giving the former as 1762, and Brive, in the department of Corrèze, as the place where he first saw the light of day. He was educated at Brive and at Paris, took orders in 1781, and eight years later became a fully ordained priest. The Revolution altered the ecclesiastical future of Latreille, for in 1793 he was arrested on the charge of neglecting to take the oath of allegiance to the new Government, was thrown into prison, and sentenced to exile in Cayenne in company with other recalcitrant priests.

Latreille was saved from this fate by the influence of friends and by a fortunate accident, the story of which is of considerable interest. On the wall of his cell, which he shared with an invalid prisoner, Latreille, who was already an expert entomologist, found a specimen of a beetle that he recognised as new to science; the surgeon attending the invalid observed Latreille's excitement, and on discovering the cause of it asked if he might give the specimen to a scientific friend, M. Bory. Next day the surgeon brought back word that M. Bory was unable to identify the new beetle, and Latreille, perceiving that he was dealing with a brother entomologist, sent him the message:—"Vous lui direz que je suis l'Abbé Latreille, qui va aller mourir à la Guyane avant d'avoir publié son 'Examen des Genres de Fabricius.'" Steps were immediately taken to free the captive, and he was literally snatched from the ship bearing the exiles to Cayenne; the ship subsequently foundered off the French coast, and all hands were lost. Latreille, in his classic work on insects and crustaceans, describes the insect that was the means of his salvation as *Necrobia ruficollis*, and details the circumstances of its discovery; in his "Genera crustaceorum et insectorum" he apostrophises it as "Insectum mihi carissimum," and a representation of it is carved on the bust of the great entomologist in the museum at Brive with the inscription "Necrobia ruficollis Latreillii salus anno MDCCXCIII.

After these adventures Latreille returned to Brive, and tranquilly resumed his entomological studies. The end of the eighteenth century in France was marked by the immense stimulus given to the scientific study of agriculture; societies for the encouragement and advancement of agriculture sprang up everywhere, and met with official sanction and help. Experiments on the cultivation of all sorts of crops were carried out, new agricultural machines were invented and tested, efforts were made to combat insect pests, and the methods of other countries were studied. In fact, France more than a century ago had arrived at a stage in agricultural progress which the modern Englishman may well envy. To-day an industrious peasantry, firmly rooted to the soil, is the prop and mainstay of France, and who can doubt that their existence is largely due to the work of those early agricultural societies, called into being themselves by the revulsion of feeling against a tyrannical and effete landed aristocracy? The cry of "Back to the Land" is only heard in those countries where the needs of agriculture are regarded by legislators with languid indifference.

In a milieu of eager and scientific inquiry a man like Latreille was bound to make his mark; he was appointed professor of natural history at Brive, and in 1798 was elected a member of the Institut National des Sciences et des Arts of France. During these years he was in active correspondence with Fabricius, to whom he owes his title of *Princeps Entomologiae*, with Olivier, Bosc d'Antic, and other entomologists of the day, and he was personally known to the Paris zoologists, the great Cuvier, Duméril, Daubenton, and Lacépède. Several of his letters are quoted by M. de Nussac, and these alone show, even if we had not his published works to convince us, that Latreille possessed the true Frenchman's power of generalisation and ability to seize on characters of prime importance for systems of classification. In 1796 Latreille published at Brive his first great work, "Précis des Caractères génériques des Insectes," which earned for him the plaudits of the entomological world of the day; it was followed by "Essai sur l'Histoire des Fourmis de la France," and shortly afterwards Latreille migrated to Paris to take up a post in the Natural History Museum. There his biographer leaves him, but promises a second volume on his subsequent career; M. de Nussac will find it difficult to write a more interesting volume than his first.

R. S.

OUR BOOK SHELF.

The Steam Turbine as Applied to Marine Purposes. By Prof. J. H. Biles. Pp. vii+126. (London: Charles Griffin and Co., Ltd., 1906.) Price 6*s.* net.

PROF. BILES delivered the Keith lectures before the Royal Scottish Society of Arts in Edinburgh during the spring of 1906, and as only a condensed summary of the lectures was published by the society in its monthly journal, while many requests were made to the lecturer for complete copies of the lectures, he decided to publish them in book form.

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Before dealing with the special form of turbine most suitable for marine purposes, the author gives a condensed and useful account of the development of the turbine from the time of Hero to the present day. In the second chapter the main features in the design of marine turbines are discussed, and then a detailed account is given of the method of blading the turbine drum and casing. In a convenient table at the end of this chapter the author gives in detail the sizes of the blades and their spacing for the H.P., L.P., and astern turbines of an ocean liner. The next chapter is well illustrated, and the reproductions of photographs, taken at various stages in the process of building a large set of marine turbines, will do much to make the non-technical reader familiar with the more important details in turbine construction. The thermodynamic principles which govern the design of turbines are then briefly touched upon, and their application illustrated by the calculations, necessary in determining blade dimensions for a channel steamer, being fully worked out. The success of the marine turbine is so entirely dependent on the efficiency of the propeller to which it is connected that it was most desirable that Prof. Biles should in these lectures discuss fully the theory and design of the screw propeller as employed in turbine vessels; the important and complete series of experiments carried out at the United States Navy Tank at Washington are admirably summarised; the results are illustrated by graphs, and their application to the design of a propeller which has to work under any given set of conditions is clearly explained.

The book concludes with a summary of all the trustworthy information at present available as to the comparative economy of turbine and reciprocating marine engines, and it is worth pointing out that, judging from the performances of certain cross-channel steamers, the considerable economy of the turbine-engined steamer which is shown during the preliminary trials is apparently not maintained in active service, though the author has every confidence that this loss in economy, which he considers is due to cavitation, will eventually be overcome.

T. H. B.

A First Year's Course in Geometry and Physics. By Ernest Young. Parts i. and ii. Pp. viii+101. (London: George Bell and Sons, 1907.) Price 1s. 6d.

This satisfactory first year's course of work in geometry and physics recognises fully the desirability of making the introductory lessons in mathematics and science as practical as possible. The author is an experienced schoolmaster who understands the need of setting young pupils to do things for themselves if they are really to understand the subjects under consideration. Though there is little that is novel in the methods adopted, the book provides an abundance of well graduated exercises suitable for boys of twelve to thirteen years old.

New Geometry Papers. By Rupert Deakin. Pp. 103. (London: Macmillan and Co., Ltd., 1907.) Price 1s.

The recent changes in teaching geometry have rendered Mr. Deakin's "Rider Papers on Euclid" of little use in most schools, and the present book is intended to serve a similar purpose under the new conditions. The papers are graduated and arranged in order of difficulty, while hints are provided on the method of solving riders. The collection should prove useful as a supplement to the school text-book of geometry.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* Nature. *No notice is taken of anonymous communications.*]

The Name of the Cave Horse.

In the paper on the derivation of the horse in the April number of the *Quarterly Review*, to which reference was recently made in Nature, Prof. J. C. Ewart expresses the opinion that the wild Mongolian horse, commonly known as Przewalski's horse, is identical with the horse depicted by the prehistoric inhabitants of La Madelaine Cave, in the Dordogne. The same view is even more emphatically expressed by Dr. E. L. Trouessart in the Bulletin of the Paris Museum (1906, p. 453). No mention is made by either writer of any change in nomenclature involved in this identification.

In the Phil. Trans. for 1906 Sir R. Owen described the prehistoric horse of the cavern of Bruniquel (Tarn et Garonne) as *Equus spelaeus* and although he estimated the height of the animal at 13½ hands, it is practically certain that it was really much less, as he was not aware of the relatively large size of the molars in the Mongolian horse.

Now it can scarcely be doubted that the small prehistoric horse of the Bruniquel cave is identical with the one depicted by the prehistoric hunters of La Madelaine, and as there is equally little doubt that both are merely races of *Equus caballus*, the name of the La Madelaine horse is *Equus caballus spelaeus*.

Hence, if Messrs. Ewart and Trouessart are right, it is also the title of the wild Mongolian horse, the name *Equus przewalskii* dating only from 1881. It is true that there is a possibility that a name given by Hamilton Smith to a horse supposed to be from Tatary may antedate both *spelaeus* and *przewalskii*, while *Equus fossilis*, dating from 1836 or 1846, may possibly be identical with *spelaeus*. Nothing certain can, however, be affirmed with regard to either of these points.

The name *E. c. spelaeus* for the La Madelaine horse certainly cannot be ignored, but it seems inadvisable that it should be made to supersede *E. c. przewalskii*, especially when the wide separation in time and space between the types of the two is taken into consideration. A way out of the difficulty may be found in a refusal to admit Messrs. Ewart and Trouessart's absolute identification of the fossil with the living form, and to regard them as distinct, although closely related, races, when they will stand respectively as *Equus caballus spelaeus* and *Equus caballus przewalskii*.

I may add that I cannot agree with Prof. Ewart in regarding the skull of Przewalski's horse as conforming to the type in which the face is bent down on the cranial axis. On the contrary, it is more or less of the straight type, in common with the prehistoric horses of Europe. The bent type seems to me characteristic of domesticated breeds, especially thoroughbreds and Arabs, and as it also occurs in the fossil Indian *Equus sivalensis*, my suggestion that Arabs and thoroughbreds are descended from that species, while the ordinary "cold-blooded" European horses trace their origin to the "Przewalski," is strongly confirmed. In a short time I hope to put skulls of the two types on exhibition in the Natural History Museum, so that visitors can judge for themselves on the point at issue.

R. Lydekker.

The Enigma of Life.

In the review of my book "The Evolution of Life" in Nature of May 2 (p. 1), "J. A. T." admits his inability to "point out precisely where my experiments are fallacious," and says he does "not know what to answer unless it be that the sterilisation was inadequate, or that the preparations were contaminated before the photographs were taken." But the adequacy of the sterilisation, in accordance with all existing knowledge, is fully shown in the book; and, as for the last suggestion, it seems

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